Abstract

A structured multithreaded programming system is described for integrated use with existing and new programming languages and systems. The structured multithreaded programming system enables programs to be developed which include both multithreaded and multithreadable code constructs. The multithreaded code constructs require explicitly concurrent execution. The multithreadable code constructs can be executed either sequentially or concurrently, at the selection of the programmer or computer user. When executed concurrently, the different threads of execution in a multithreaded program developed with this system can be synchronized using innovative synchronization objects. One type of synchronization object is a special type of counter, which can be constrained to be monotonically increasing in value. Another related type of synchronization object is a special type of flag, which can be constrained to have its value set monotonically.